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State of Utah
DEPARTMENT OF NATURAL RESOURCES

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Division of Oil, Gas and Mining

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November 27, 2013

Lantz Indergard
Lisbon Valley Mining Company, LLC
PO Box 400
Moab, Utah 84532

Subject: Review of Work Plan for Additional Geochemical Testing of Lisbon Valley Mine Waste Rock, Lisbon Valley Copper Mine, Lisbon Valley Mine, M/037/0088, San Juan County, Utah

Dear Mr. Indergard:

The Division of Oil, Gas and Mining has reviewed the Work Plan for Additional Geochemical Testing of Lisbon Valley Mine Waste Rock received in our office on November 18, 2013. The Division agrees with the testing methods and procedures outlined in the document, with the following recommendations:

1) On Page 2, clarify what the three monolithologic saturated columns will represent. The contents of the text and the referenced Table 2 leave some question as to what the three individual columns will represent (lithic beds, pit ID, etc.?).

2) On Page 4, the Work Plan says an additional sample of well water will be sent to ACZ for "analysis of head solution at the same time and submit the sample directly to ACZ with the standard GW analytical suite." The Division recommends that samples of the well water collected for running these tests be subjected to the same suite of analyses prescribed for the MWMT leachate and the equipment blanks in Tables 5 & 8. This should quantify the background levels of all the target analytes and help to better understand the broader chemistry of the existing aquifer than the "standard GW analytical suite." It should also provide a better understanding of the potential contribution of contaminants to the aquifer by the leaching of backfilled rock material.

3) On Page 6, identify the initial pH of the MWMP test extraction water and whether it will be Burro Canyon groundwater.

4) On page 7, modify or remove what appears to be a duplicate ABA test method at the bottom of the list.

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5) On Pages 7, 8 and 11, the Division suggests that you include nitrates, radium, and gross alpha particle activity measurements in your lists of analytes in the planned chemical analyses and leach tests (with limits and methods meaningful to EPA and Utah DWQ groundwater protection standards).

6) Page 8, Table 7 – What is the purpose of Table 7? There is no reference to it in the text.

7) Page 13, 4.5.4.1 states that the columns will be maintained at room temperature for the duration of the test. It is understood from basic chemistry that temperature has an effect on dissolution rates of minerals in water (pressure as well, but this scenario has near-surface conditions). Has consideration been given to running the tests at the in-situ groundwater temperature?

On a separate note, the Division was apparently given an incorrect version of the 2012 Waste Rock Monitoring Plan that did not include the laboratory data to verify the sulfur concentrations and associated acid generation potential for the sampled rock. In your 2013 Waste Rock Monitoring Plan, please ensure that the measured sulfur concentrations and acid generation potential calculations are correct.

Sincerely,

Paul Baker
Minerals Program Manager

PB: mpb: eb
cc: Rebecca Doolittle, BLM Moab FO (rdoolitt@blm.gov)
Jerry Mansfield, SITLA (jmansfield@utah.gov)
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